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Compact tension test behaviour of Pseudo-ductile thin-ply carbon/ glass hybrids

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The aim of this work was to investigate the notched behaviour of thin ply pseudo-ductile carbon/glass hybrid laminates with in-plane Over-height Compact Tension (OCT) specimens. Therefore, a series of tests were performed on two different thin-ply carbon/glass hybrid configurations fabricated from Quasi Isotropic (QI) hybrid constituents and architectures. The first consisted of thin ply carbon M46JB/thin ply glass (X-strand) and the second thin-ply carbon TC35/standard thickness S-glass prepregs. For comparison, all glass and all carbon laminates were investigated as well. A detailed assessment of the damage evolution was carried out using X-ray Computed Tomography (CT). Results show that the hybrid configurations have a higher stiffness compared to the all glass samples. A progressive and gradual failure of the hybrids resulted in gradual load-pin opening displacement (POD) curves, where there was no significant sudden load-drop that happened for the all carbon laminates due to the catastrophic failure mechanisms. The damage in the hybrid configurations was visually detectable and agreed well with the CT-scan results, whereas it was not feasible to see the damage easily for the all glass and all carbon configurations.